

UNITED STATES PATENT OFFICE.

WILLIAM P. KOOKOGEY, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE
KOOKOGEY ELECTRIC COMPANY.

PROCESS OF MAKING SOLUTION COMPOUNDS FOR GALVANIC BATTERIES.

SPECIFICATION forming part of Letters Patent No. 409,291, dated August 20, 1889.

Application filed July 3, 1889. Serial No. 316,441. (No specimens.)

To all whom it may concern:

Be it known that I, WILLIAM P. KOOKOGEY, of the city of Brooklyn, county of Kings, and State of New York, have invented a new and
5 useful Process of Making Solution Compounds for Galvanic Batteries, of which the following is a specification.

My invention relates to processes for making the dry compound which consists of tri-
10 oxide of chromium and bisulphate of soda, and which may be converted into a solution for battery use merely by the addition of water.

In an application heretofore filed by me for
15 a galvanic-battery solution, filed December 14, 1886, Serial No. 221,555, such a compound is described and a process for making it, and in two patents granted upon my application for methods of preparing solution compounds
20 for galvanic batteries, each dated January 8, 1889, and numbered, respectively, 395,835 and 395,837, are described two improvements in such process; but in all three of those applications the processes start with taking sul-
25 phate of soda, sulphuric acid, and bichromate of soda as the fundamental ingredients, and the trioxide of chromium and bisulphate of soda are formed together in the course of such processes. I have, however, discovered that
30 the trioxide and the acid sulphate may be made separately and afterward combined, and that the result in such case is an improvement for certain purposes over the methods by which they are made in combination with
35 each other. This is the gist of the present invention. By the process herein described in which the two elements are separately made and afterward combined a compound is produced which may be made of any desirable
40 degree of richness in chromium and suitable for any form of battery. The product may be made either as a plastic substance or it may be made as a substantially dry compound.

To describe the best way of following out
45 the process more in detail take any strong solution of chromic acid, add thereto a quantity of sulphuric acid sufficient to precipitate the chromium contained in said solution in the form of trioxide of chromium, and decant
50 the liquid above such semi-solid mass of trioxide. A solution of chromic acid well suited

for this purpose is the solution made according to the formula described in the patent for galvanic-battery solution issued to me March
29, 1887, No. 360,024, or in the patent issued 55 to me for a battery-solution, dated June 14, 1887, No. 364,656, as in such solution the sulphate of the base is absent, having been removed by the process. To form the acid sulphate of soda, take sulphate of soda, add 60 thereto an excess of sulphuric acid, preferably, but not necessarily, heated, allow it to cool, and collect the crystals of bisulphate of soda thus produced. Apply sufficient heat to the crystals of bisulphate of soda to cause 65 them to dissolve without the addition of water or any other admixture. To the thus dissolved bisulphate of soda add the trioxide of chromium, stirring. The result is a plastic compound which should be packed in air- 70 tight vessels until used. If it is desired to form it into a substantially dry compound, this may be done by allowing the mixture of bisulphate and trioxide to remain at a high temperature for a sufficient time to drive off 75 as much as practicable of the water. The heat for this purpose should be below the boiling-point, and care should be taken that the heat be not sufficient or continued long enough to convert any part of the chromium into sesqui- 80 oxide of chromium.

The amount of trioxide which is to be added to the dissolved bisulphate is immaterial from a chemical standpoint, being regulated only
85 by questions of economy and the special form of battery to be used. In the absence of any special conditions I would recommend the addition of the trioxide to the bisulphate in the proportion of about one to four, by weight.

I claim as my invention—

1. The process of making a chromic-bat- 90 tery compound, consisting of the following steps: first, taking bisulphate of soda and trioxide of chromium manufactured separately; second, dissolving the crystals of the bisul- 95 phate by heat without the addition of water, and, third, adding thereto the trioxide of chromium, stirring, substantially as described.

2. The process of making a chromic-bat- 100 tery compound, consisting of the following steps: first, adding an excess of sulphuric acid

to sulphate of soda, allowing it to cool, and
collecting the crystals of bisulphate of soda
thus produced; second, dissolving the bisul-
phate of soda by heat without the addition of
5 water, and, third, adding trioxide of chromium
thereto, stirring, substantially as described.
In witness whereof I hereunto subscribe my

name, in the presence of two witnesses, at New
York, this 2d day of July, 1889.

WM. P. KOOKOGEY.

Witnesses:

LINDLEY VINTON,
SALTER STORRS CLARK.